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## Emergence of Sustainability Based Approaches in Healthcare: Expanding Research and Practice

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### Abstract

The study explores the scope of sustainability practices in healthcare by systematically examining studies conducted on healthcare related issues within the context of sustainability. The review is focused on three main conceptual aspects – dimensions of sustainability practices in healthcare, drivers of sustainable practices within the industry and strategies to implement sustainability effectively in healthcare. Relevant literature on sustainability in healthcare is referred to address the developed research question. Based on the identified expanding dimensions of sustainability research and practices, future research insights are proposed as conceptual models that reflect the scope of sustainability practices in healthcare. This could enhance understanding of the literature and stimulate researchers to expand the research of sustainability in healthcare in a more widespread and holistic perspective as to ensure service excellence formation for business sustainability. The implications of the study are threefold. Firstly it provides researchers and practitioners interested in healthcare literature an overview of how the concept of sustainability has evolved over time in the healthcare sector. Secondly, the paper highlights the driving forces for sustainability implementation in healthcare and strategies to continuously enhancement the sustainability implementation in healthcare.

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## 1. Introduction

The word sustainability has been used to indicate a variety of problems, even though its introduction to management research was through the issue of environmental degradation caused by the business sector. Today, the meaning of the term sustainability cannot be restricted to environmental wellbeing alone, rather it has to be extended to accommodate a set of other aspects such as the wellbeing of the customers, the employees and the community. Leading the business practices with elements of sustainability is importance for efficient resource management, continuous improvement of the services and cost effectiveness, in the provision of forming service excellence for business sustainability. However, the present literature on sustainability in healthcare is not structured enough to effectively differentiate these implicit categories within sustainability related issues. A clear explanation of what sustainability means in healthcare is only possible with an in depth examination of structured research questions. Therefore, through a qualitative investigation, this study applies a content analysis regarding the issue of sustainability in healthcare literature. The discussion and concern of sustainability in healthcare was organised based on (1) dimensions of sustainability practices, (2) drivers of sustainable practices and (3) strategies to implement sustainability effectively. This study referred only to articles in which investigation on healthcare was the main research agenda of the paper.

## 2. Definition of sustainability

The idea of ‘sustainability came into being as a result of people’s realization about the impact of their activities, both commercial and non-commercial, on environment. People remained rather blind about the after-effects of their exploitative actions until there were large scale repercussions in the form of global warming, climate change and public concern. It was such consequences that triggered an active discussion on the need for cautious actions concerning the environment. Subsequently more systematic examination of the role and relevance of sustainability in shaping the world into a sustainable environment have emerged.

One of the initial formal articulations of sustainable development is in the Burtland Report published by the United Nation in 1987. The report defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Johnson et.al, 2007). This definition not only conveyed different meaning for different people, but also included a wide variety of things under the name other than fundamental meaning- action against environmental degradation, was scaled down in the multitude of other similar concepts that were brought in. While it need not be essentially bad per say in terms of having a common name for similar things, the term ‘sustainability’ being used to address a variety of issues (from environmental stability to organizational stability) which makes it difficult to distinguish who’s sustainability is being discussed.

Two of the prominent definitions of sustainability in environmental perspective are, 1) "of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged" [sustainable techniques][sustainable agriculture] and 2) "of or relating to a lifestyle involving the use of sustainable methods" [sustainable society]." However, stewing from the fact that these definitions are vague and less useful at an operational level, Swedish scientist Karl-Henrik Robert came up with a more practice oriented approach for sustainability which delineates the characteristics of a sustainable society. According to him, an ideal society would strive to reduce its contribution towards:

- the increase in concentrations of substances from the Earth's crust.
- the increase in concentrations of substances produced by society.
- physical degradation of nature.
- conditions that systematically undermine people's capacity to meet their needs.

There has also been a detailed examination of the concept in the organizational literature as well, covering the streams of business, marketing, as well as social sciences. These works mainly focus on the literal definition of ‘sustainability’ which means the ability of a firm to survive over a long time across wide range of phenomena. The key here is that the sustainability of one particular organization or system does not matter; it is at the stake of other entities in the environment. However, the definition of the European Union is more holistic in the sense that it takes

into account many facets of sustainability including the economic, social and environmental effects of all policies that examined systematically before making a decision (EU, 2001). Thus the scope of sustainability is not only limited to addressing the environmental stability and organizational stability but it also concerns social issues.

### 3. Literature on sustainability in healthcare

In healthcare research, attention has been directed to the development of special innovation practices such as biopharmaceuticals and biotechnology to enhance sustainability practices (Rosenberg-Yunger, Daar, Singer, & Martin, 2008) while a group of research have been centered on environmental sustainability for reducing the impact of the healthcare operation on the environment and organizational stability to reduce the cost and making the service affordable for both the providers and the consumers (Chandra, Rinkoo, Verma, Kapoor, & Sharma, 2013; Price, Sergelen & Unursaikhan, 2013). In these studies the discussion on environmental sustainability in healthcare is structured around the issues of waste management and pollution (Berwick & Hackbarth, 2012). Klangsin & Harding (1998) argues that medical waste has become one of the primary sources of pollution around the world, and is a crucial factor in spreading diseases, and affecting the quality of air, water and the soil around the hospitals. The potential risk associated with the mal-practices in hospital waste management has led to serious protests from the public in several societies (Faure & Rizzo, 2003). Conversely, as healthcare organizations continue to evolve worldwide in search of better quality, reduced operating cost, and improved consumer trust, sustainability towards customer care and employee care are also becomes the key to build core competencies. Therefore, it has become imperative for healthcare organizations to have a multi directional focus in terms of the services it provides for the surrounding environment, customer, employee and community. Saad (2003) points out that there is a serious need for an integrated approach to the environmental impact of hospitals which incorporates the concept of other related areas as well. That would enable practitioners to assess a hospital's performance using the 'sustainability framework' and could effectively evaluate it based on the existing standards of the society. This would not only enable us better understand the environmental problems associated with the healthcare operations, but also equip us with solution frameworks from other areas to solve the problem.

In general, this study found that the existing research on sustainability has mainly focused on environmental stability and organizational stability which concerns itself mainly on financial issues. Little efforts made to highlight the other areas of sustainability practices in healthcare and the prospect of looking at sustainability facets as holistic practices is under research. Therefore, to gain more understanding about the emerging scope of sustainability practices in healthcare, in this study, we explore the following research questions:

- a) What is the definition of sustainability in healthcare?
- b) What are the dimensions of sustainability practices in healthcare sector?
- c) What drives the evolution of sustainability in healthcare?
- d) How can sustainability be effectively implemented in healthcare?

### 4. Dimensions of sustainability practices in healthcare

Studies claim that the implementation of sustainability in healthcare operations would result in both financial and quality improvement for healthcare (Tudor, 2007). In order to optimize the benefits of sustainability practices in an organization, it is important to understand the sustainability based practices. Based on the investigation conducted from our literature review of sustainability in healthcare context, this study found that sustainability practices in hospitals' operation can be subdivided into four categories: environment, customer, employee and community as an approach to achieve sustainability goals to continuously improvement quality and financial performance. Figure 1 reflects the expanded sustainability framework.

#### 4.1. Environment orientated sustainability

Healthcare industry is known to practice environmental sustainability and this approach undertakes not only to improve the environment pollution by reducing waste (e.g. recycle water and minimize use of hazardous chemicals)

in operations, but it also helps to save operating cost (Kinney, 2005). Some of the practices toward environment sustainability in healthcare are eliminating mercury, reducing toxicity of healthcare waste and minimizing the use of hazardous chemicals (Kinney, 2005; Yang et al., 2009). Meanwhile, recycling is also being introduced to reduce rising quantities and treatment costs (Tudor, 2007). In later years, environmental sustainability scope has also been extended to sustainable design and building techniques to create true healing environment (Kim & Osmond, 2013; Kinney, 2005).

#### 4.2. Customer orientated sustainability

Healthcare providers also realized the importance of offering quality service to patients and seek to balance the resources and needs of patients as part of sustainability practices (Faezipour & Ferreira, 2013). In addition to the advanced use of technology in healthcare as to provide good treatment and services to customers, many healthcare organizations have now developed a health information or e-health strategy (Coiera & Hovenga, 2007). Information technology is important to direct health organizations towards sustainability since it can help to increase efficiency, create tools for sustainability and redesign products into services (integrate system and lifestyle for example send vaccination due reminder) (Coiera & Hovenga, 2007). Patient satisfaction is considered as one of the important measures in healthcare sustainability which is closely related to service quality improvement, reduced medical bills and meeting customer expectation (Chandra et al., 2013).

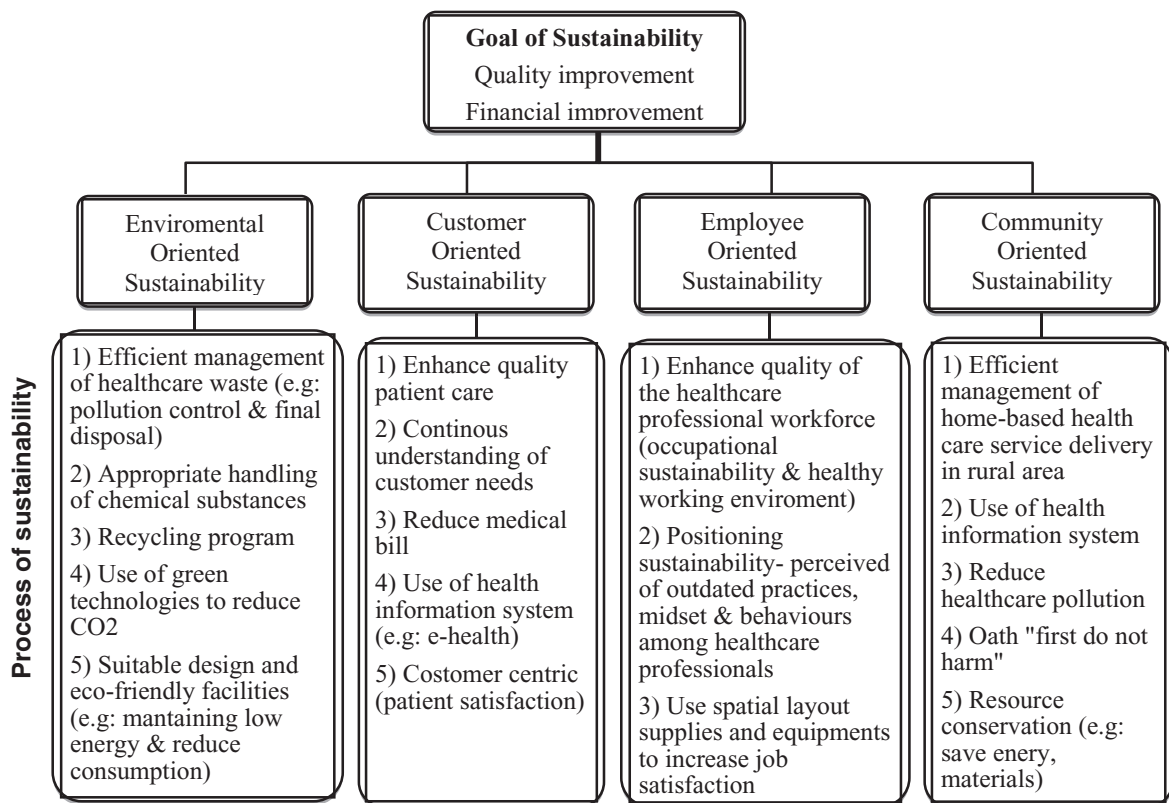


Fig. 1. Expanded sustainability framework.

#### 4.3. Employee orientated sustainability

In the healthcare context, sustainability is not only all about taking care of patients but it also refers to the organization's care to employees by creating healthier workplace. Occupational sustainability in healthcare services involves meeting the demands of changing healthcare operations without compromising the health and wellbeing of the medical practitioners (Knowles, 2010). Thus creating a healthy work environment is an important element that employers should include to increase the job satisfaction of their staff. Meanwhile positioning sustainability in the professional mind set in healthcare also would gear up the practice of sustainability in the organization. This effort can generate a wealth of applied knowledge and support the emergence of sustainability thinking among the health professions (Mortimer, 2012). Some healthcare organizations also emphasize the persistence of outdated practices and behaviors among healthcare professionals (Paper, Pinzone, Lettieri, & Masella, 2012) as part of their efforts to continuously improve the quality of service provided by medical practitioners. Research has also claimed the importance of spatial layout, equipment and supplies in increasing the job efficiency and job satisfaction of the nurses (Paper, Pinzone, Lettieri, & Masella, 2012).

#### *4.4. Community orientated sustainability*

In the context of sustainability for community, some studies have discussed the healthcare delivery under 'home-based healthcare' program as one activity towards sustainability (Barjis, Kolfshoten, & Maritz, 2013; Plochg, Delnoij, Hoogedoorn, & Klazinga, 2006). This is due to the limited access, medical errors and negligence at rural areas and their inhabitants. The sustainability based services for this community is upgraded with the use of technology such as tele-monitored and patient monitoring system (Barjis et al., 2013) although initially it was just limited to health information exchange system (Vest, Campion, & Kaushal, 2013). Besides that, taking into consideration public concern, the healthcare industry also draw actions towards resource conservation and pollution reduction (Kinney, 2005) while principle of "first do no harm" in carrying out their profession has become the preference of many healthcare organization (Arce-Corrales, Gomez-Alvarez, & Alvarez-Chavez, 2014).

### **5. Factors influencing sustainability in healthcare**

Healthcare industry incorporates sustainability into their business based on social obligation and social responsiveness. Review of the research conducted on sustainability in healthcare reveals that there are many factors contributing to the increase of sustainability practices in healthcare as shown in Figure 2. Some of the factors are:

- Increasing concern of government in many countries on issues of sustainability in healthcare; for instance, drawing policies to save energy and preserve the environment has pushed many healthcare organizations to formulate sustainability into their practices (Paper et al., 2012).
- Changes that are happening at the environmental level such as global warming, pollution, shortage of natural resources (e.g. energy and water) ultimately force the healthcare industry to find ways to incorporate sustainability based practices in its operation (Paper et al., 2012).
- Education and raising awareness of society on how the natural resources are being utilized by business and how it's activities contribute to shortage of resources and pollution have also placed a great demand on healthcare to apply sustainability based practices in its operations (Paper et al., 2012; Yang et al., 2009).
- Corporate sustainability is becoming increasingly significant in many healthcare organizations. In healthcare some aspects such as staff development, organizational culture, innovation, social responsibility, and ethical behavior are automatically channeled toward incorporation of sustainability in the healthcare organization (Kantabutra, 2011).
- Rising cost of healthcare in many countries have compelled them to focus on sustainability as a mean to reduce operating costs (Hudson & Vissing, 2013).

### **6. Strategies for implementing sustainability effectively in healthcare**

Rising resource cost, climate change, public awareness and changing lifestyles are likely to create an increasing stimulus for healthcare to implement sustainability based operations. In order to continuously institute an

organizational culture of sustainability in healthcare organization, several strategies and recommendations are proposed as follows

- Develop leadership for sustainability to plan specific strategies for sustainability and continuously monitor the implementation stage (Parsons & Cornett, 2011). Activities such as staff participation on steering committees and staff learning assessment should be increased. Fostering a healthy environment reflects the sustainability of employees leadership to continuously improve the quality of service (Pearson et al., 2007).
- Improve sustainability awareness and enhance staff involvement to sustain the practice of sustainability in healthcare. Programs such as motivation, training and development of instructional resources or materials need to be increased continuously (Dunphy, 2013; Higuchi, Downey, Davies, Bajnok, & Waggott, 2013)
- Give more attention to advance the innovation that will improve the sustainability of healthcare (Doyle et al., 2013; McGain & Naylor, 2014) in every dimension of sustainability practices.
- Conduct social and psychological research among medical practitioners to understand the behaviors, attitudes and cultures that will be needed to improve sustainability in hospital (McGain & Naylor, 2014).
- Increase collaboration between different specialties including non-medical professionals (e.g. engineers, architects) to facilitate the healthcare organization to face the sustainability challenges (Ramirez, West, & Costell, 2013).
- Healthcare organizations should also extend their collaboration with relevant association and NGOs (McGain & Naylor, 2014). Some of the leading resources in the healthcare sustainability movement at international level are United States Green Building Council [www.usgbc.org](http://www.usgbc.org), Green Guide for Healthcare [www.gghc.org](http://www.gghc.org), Practice Green Health <http://practicegreenhealth.org/>, American Society for Healthcare Engineering [www.ashe.org](http://www.ashe.org), Global Health and Safety Initiative [www.ghsi.ca](http://www.ghsi.ca) and Healthcare without Harm [https://noharm.org](http://noharm.org)

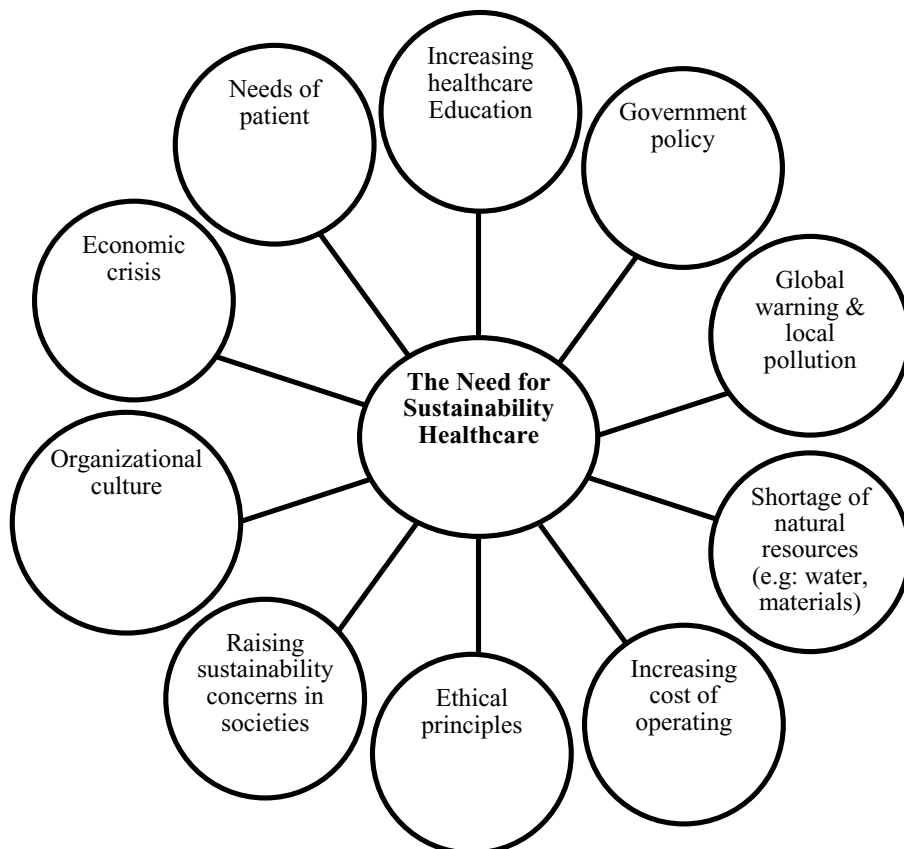




Fig. 2. Driving factors of sustainability in healthcare.

## 7. Conclusion

As service excellence in healthcare context is the ability of the provider to consistently meet and manage patient expectations, this paper presents the preliminary findings from a systematic review of literature on the sustainability of the healthcare sector for service excellence formation that centered on enhancing the life quality of human. The study identifies a gap in integrating the sustainability practices into healthcare management. This study described that the emergence of sustainability in healthcare involves balancing of four key factors in its operating process: environment concerns, the needs of patients, the needs of employees and community concern as to continuously improve the quality and reduce cost. The drivers for the emerging sustainability practices and strategies to sustain the sustainability practices are discussed. This study extends the statement made by the researcher that sustainable healthcare combines quality patient care and minimizing environmental impact (Jameton & McGuire, 2002). Two other processes found from the literature and added into this study are quality working environment and preserving environment for community which centered on the benefits for employees and communities respectively. One of the future suggestions, which we could immediately identify, is about expanding the scope of sustainability in healthcare beyond environmental sustainability into human based sustainability (e.g. patient, employee and community) for enhancing organizational excellence and high quality of service. Research in future should expand and compare other issues related to sustainability formation in healthcare in a more integrative and holistic perspective.

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## References

- Arce-Corrales, M. E., Gomez-Alvarez, A., & Alvarez-Chavez, C. R. (2014). Chemical substances sources characterization in support of the health sector's sustainability and quality in Sonora, Mexico. *Journal of Cleaner Production*, 64, 457–463.
- Barjis, J., Kolfshoten, G., & Maritz, J. (2013). A sustainable and affordable support system for rural healthcare delivery. *Decision Support Systems*, 56, 223–233.
- Berwick, D. M., & Hackbarth, A. D. (2012). Eliminating waste in US health care. *Jama*, 307(14), 1513–1516.
- Coiera, E., & Hovenga, E. J. S. (2007). Building a sustainable health system. *Yearbook of Medical Informatics*, 46, 11–18.
- Chandra, H., Rinkoo, A. V., Verma, J. K., Kapoor, R., & Sharma, R. (2013). Supply chain management with cost- containment & financial-sustainability in a tertiary care hospital. *Journal of Health & Human Services Administration, Summer*, 36(1), 3–23.
- Doyle, C., Howe, C., Woodcock, T., Myron, R., Phekoo, K., McNicholas, C., & Bell, D. (2013). Making change last: applying the NHS institute for innovation and improvement sustainability model to healthcare improvement. *Implementation Science : IS*, 8(1), 127–137.
- Dunphy, J. L. (2013). Healthcare professionals' perspectives on environmental sustainability. *Nursing Ethics*, 21, 414–425.
- Faezipour, M., & Ferreira, S. (2013). A system dynamics perspective of patient satisfaction in healthcare. *Procedia Computer Science*, 16, 148–156.
- Faure, P., & Rizzo, P. N. (2003). Hospital and environment: waste disposal. In *Annales Pharmaceutiques Francaises*, 61(6), 373–377.
- Higuchi, K. S., Downey, A., Davies, B., Bajnok, I., & Waggott, M. (2013). Using the NHS sustainability framework to understand the activities and resource implications of Canadian nursing guideline early adopters. *Journal of Clinical Nursing*, 22, 1707–1716.
- Hudson, C. G., & Vissing, Y. M. (2013). Sustainability at the edge of chaos: Its limits and possibilities in public health. *BioMed Research International*, 1–7.
- Jameton, A., & McGuire, C. (2002). Toward sustainable health-care services: principles, challenges, and a process. *International Journal of Sustainability in Higher Education*, 3(2), 113–127.
- Kantabutra, S. (2011). Sustainable leadership in a Thai healthcare services provider. *International Journal of Health Care Quality Assurance*, 24(1), 67–80.
- Kim, S., & Osmond, P. (2013). Analyzing green building rating tools for healthcare buildings from the building user's perspective. *Indoor and Built Environment*, 23(5), 757–766.
- Kinney, L. M. (2005). Sustainability, 23–27.
- Klangsin, P., & Harding, A. K. (1998). Medical waste treatment and disposal methods used by hospitals in Oregon, Washington, and Idaho. *Journal of the Air & Waste Management Association*, 48(6), 516–526.

- Knowles, J. (2010). Establishing a sustainable nursing workforce. *Nursing Management* (Harrow, London, England: 1994), 17, 34–36.
- McGain, F., & Naylor, C. (2014). Environmental sustainability in hospitals - a systematic review and research agenda. *Journal of Health Services Research & Policy*, 19, 245–252.
- Mortimer, F. (2012). Emerging Sustainability: Reflections on working in sustainability and health, 14(1), 87–94.
- Mullot, J., Karolak, S., Fontova, A., & Levi, Y. (2010). Modeling of hospital wastewater pollution by pharmaceuticals: first results of Mediflux study carried out in three French hospitals. *Water Science & Technology*, 62(12), 2912–2919.
- Paper, R., Pinzone, M., Lettieri, E., & Masella, C. (2012). Sustainability in Healthcare: Combining Organizational and Architectural Levers Regular Paper, 4, 1–9.
- Parsons, M. L., & Cornett, P. a. (2011). Leading Change for Sustainability. *Nurse Leader*, 9(4), 36–40.
- Plochg, T., Delnoij, D. M. J., Hoogedoom, N. P. C., & Klazinga, N. S. (2006). Collaborating while competing? The sustainability of community-based integrated care initiatives through a health partnership. *BMC Health Services Research*, 6, 37, 1–14.
- Price, R., Sergelen, O., & Unursaikhan, C. (2013). Improving surgical care in Mongolia: A model for sustainable development. *World Journal of Surgery*, 37, 1492–1499.
- Quinn, M. M., Fuller, T. P., Bello, A., & Galligan, C. J. (2006). Pollution prevention - occupational safety and health in hospitals: alternatives and interventions. *Journal of Occupational and Environmental Hygiene*, 3(4), 182–193.
- Ramirez, B., West, D. J., & Costell, M. M. (2013). Development of a culture of sustainability in health care organizations. *Journal of Health Organization and Management*, 27, 665–672.
- Rosenberg-Yunger, Z. R. S., Daar, A. S., Singer, P. a., & Martin, D. K. (2008). Healthcare sustainability and the challenges of innovation to biopharmaceuticals in Canada. *Health Policy*, 87, 359–368.
- Saad, S. G. (2003). Integrated environmental management for hospitals. *Indoor and Built Environment*, 12(1-2), 93–98.
- Tudor, T. L. (2007). Towards the development of a standardised measurement unit for healthcare waste generation. *Resources, Conservation and Recycling*, 50, 319–333.
- Vest, J. R., Campion, T. R., & Kaushal, R. (2013). Challenges, alternatives, and paths to sustainability for health information exchange efforts. *Journal of Medical Systems*, 37, 1–8.
- Yang, C., Peijun, L., Lupi, C., Yangzhao, S., Diandou, X., Qian, F., & Shasha, F. (2009). Sustainable management measures for healthcare waste in China. *Waste Management*, 29(6), 1996–2004.